ferns. I have specimens from Santo Domingo (Weinland, 33), Cuba (Wright, 799) and Porto Rico (Garber, 41).

Mr. Davenport informs me that Mr. Curtiss has collected a large stock of this fern, and will distribute it in his fascicles for 1882, which will probably contain also *Asplenium serratum*, *Taenitis lanceolata* and the royal palm, *Oreodoxa regia*.

37. *Pellaea densa*, Hooker.—The range of this fern is greatly extended by Prof. O. D. Allen and his son, Mr. J. A. Allen, who found it on Mount Albert, in Lower Canada, July 30, 1881. It grew exposed to the sun on the steep walls of ravines at 2,000 to 3,000 feet elevation. Mt. Albert is near West Longitude 69° 30′, N. Lat. 47° 15′. The same plant is No. 819 of Mr. Cusick's Oregon distribution.

38. *Phegopteris calcarea*, Fée.—A second station for this very rare plant is at Decorah, Winneshiek Co., Iowa, where it was found last season "in the crevices of the north side of a limestone bluff" by Mr. E. W. Holway. My specimens were kindly sent by Mr. J. C Arthur, of Charles City, Iowa.

39. *Aspidium aculeatum*, var. *scopulinum*, Eaton.—This has been reported in the BULLETIN from Utah, by Mr. M. E. Jones. The Messrs. Allen collected it July 26, 1881, on the side of a rocky ravine on Mount Albert, Lower Canada. Mr. Suksdorf sends it also from Mt. Adams, Washington Territory. Some of Mr. Lemmon's plants seem to show so gradual a transition of this into *A. mohrioides*, that it would look as if the latter would have to be considered an extreme form of *A. aculeatum*.

40. *Aspidium trifoliatum*, Swz.—Mr. Curtiss has now distributed fine specimens of this tropical fern. Mr. Davenport has received from Dr. Engelmann a specimen collected long ago in Western Texas by Lindheimer. That region of Western Texas has scarcely been visited by botanists for many years, and not a few of our rarest ferns are found principally there.

41. *Woodsia obtusa*, var. GLANDULOSA, is the name suggested by both Mr. C. E. Faxon and myself for the form called *W. Plummerae* by Mr. Lemmon. The involucre is exactly that of *W. obtusa*, the habit scarcely differs, and the glandular pubescence is so variable, often almost lacking, that no reliance can be placed upon it for a specific distinction. This fern has been badly mixed by collectors with *W. Mexicana*. The affinity of the latter is rather with *W. scopulina*.

42. *Ophioglossum vulgatum*, L.—Falcon Valley, Washington Territory, Suksdorf, 1881. Mr. Davenport kindly sends me this, and with it very immature plants of what is probably the same thing from near San Diego, just collected by Dr. Parry.

Torenia Asiatica is a pretty little hot-house plant of trailing habit, which will thrive excellently well out-of-doors during the summer. It has a prismatic calyx, two-lipped, and with sharp angles. The corolla is "short, funnel-form or tubular, with an inflated throat, 4-lobed, the upper lobe (sometimes slightly notched) outermost in the bud." The extreme portion of all but the upper lobe is of a deep

violet-purple, shading below into lavender, but with the dark color resumed in the throat. The lower lobe shows a sort of arched portion extending down towards the ovary. With the exception of this conspicuous dark margin, it is of much lighter color than the rest of the corolla.

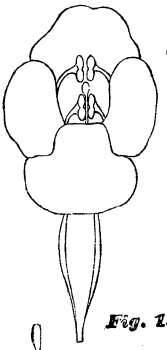

Fig. 1.

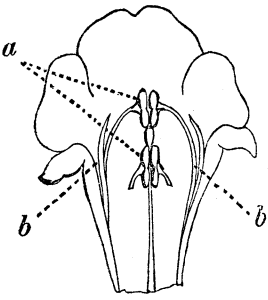

Fig. 2.

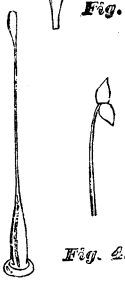

Fig. 4.

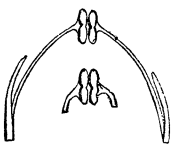

Fig. 3.

One who has given any attention whatever to the cross-fertilization of flowers by means of insects, would at once suspect this plant of some neat mechanism. The irregular and showy corolla and the peculiar stamens warrant an investigation. The stamens (didynamous) are extremely unequal in length. The lower pair arches and converges under the upper lobe of the corolla, in the form of a bow, while the shorter pair is included in the tube. Both have the anthers contiguous and, indeed, quite coherent, so that it requires some little effort to separate them. The lobes in either pair are so far divergent as to present themselves end to end, in a vertical position. The connective is large and broad. Each of the outer pair of filaments shows some distance above its adnation to the corolla, a filiform appendage, pointing forward and slighly inward. Pressure upon these, one at a time, or better, upon both simultaneously, at once deflects the staminate bow, which, upon removal of the exciting force, resumes its normal position. It would seem as if a large insect like a bee, visiting this flower, and alighting upon the convenient platform of the lower corolla-lobe, and straddling its arch, as he would have to do, would of necessity touch the filiform processes, depressing these little levers, and by throwing the anthers forward, receive more or less pollen on his back. I take the flower to be proterandrous, and think the anthers of the larger stamens open first. I have assured myself of the fact that the two-lipped stigma does not open until at least the second day after anthesis. It then bends forward from its hitherto erect position. The style is kept in place by the shorter stamens, which themselves form a bow, as will be seen in the figure. They do not, however, prevent the deflection of the stigma. Around the base of the ovary is an annular disk, within which a shallow cup is formed, perhaps containing nectar, but this I have not proved. The shorter pair of stamens, it should be said, has no appendage.

It so happens that my attention has been directed to *Torenia* so late in the season that I have not been able to determine what kind of insects would here visit it. What is here written is merely to

direct attention to the plant, which I cannot but think exhibits a pretty adaptation of means to ends.

Fig. 1 represents a front view of the flower. Fig. 2 shows the corolla laid open so as to display the filiform appendages *a*, and the anthers *b*. Fig. 3 represents the androecium. Fig. 4 shows to the left the gynoecium, and to the right the magnified stigma.

Brown University, Providence, R. I. W. WHITMAN BAILEY.

Notes on Andropogon Jamesii, Torr.—Dr. Torrey described this grass in the Annals of the New York Lyceum, Vol. i, 1824, p. 153, from specimens obtained by James on the Canadian River, and named it *A. glaucus*. Muhlenberg having already given this name to another species, Dr. Torrey changed his *glaucus* to *Jamesii* in Marcy's Report, 1852. Steudel, in his Synopsis Plantarum Graminearum, p. 392 (1855), probably not knowing of the second name given by Dr. Torrey, called it *A. Torreyanus*, under which name it has been distributed by American collectors: (No. 845 E. Hall, Texan Plants, No. 3635* A. H. Curtiss's distribution N. Am. Plants, and in the recent distribution of "Pacific Slope Plants" by Pringle.) T. S. Brandegee collected this grass at Cañon City, Colorado, and it was called in "Flora of Colorado," *A. argenteus*, Ell.

In comparing my specimens with Grisebach's description of *A. saccharoides*, Sw., there appear to be no essential points of difference, and as he (in Flora of the British West Indies) cites Arkansas and New Mexico among the habitats of this species, the supposition is that he includes with it our *A. Jamesii*, Torr. By the kindness of Mr. Watson I have been enabled to compare the spikelets of the *A. saccharoides*, Sw., (*fide* Grisebach) with those of our *A. Jamesii*, or *Torreyanus*, and the opinion that they were of one species seemed to be confirmed. The only difference noted was that in the West Indian *A. saccharoides* the hairs on the rachis were a little shorter, the fertile spikelet a little longer and the leaves pilose near the base, differences of no specific importance. In a lot of specimens of *A. Jamesii* from Texas there was a considerable variation in the size of the panicle. It is well known that many species when growing in the dry regions of the Southwest become highly glaucous when elsewhere they are not at all so.

Supposing our *A. Jamesii* to be the same as *A. saccharoides*, Sw., and I believe that it is, then Torrey's name must give place to that of Swartz, and we would have:—

Andropogon saccharoides, Sw., Flor. Ind. Occ. i, 205. (1797).
=*A. argenteus*, D C.. Cat. Monsp. 77 (*teste* Nees).
=*A. glaucus*, Torrey in Ann. Lyc. N. Y. i., p. 157. (1824).
=*A. Jamesii*, Torr. in Marcy's Report. (1852).
=*A. Torreyanus*, Steud. Syn. Gram., p. 392. (1855 .

Description:—Culms simple or branched and geniculate below, smooth except at the nodes, which are sometimes pubescent with stiff, erect or appressed hairs; sheaths smooth, shorter than the internodes; ligule obtuse, a line long. Leaves smooth or pilose near the base, 3-6 inches long, 1-3 lines wide, with very accuminate-pointed and minutely scabrous tips—the upper leaf very narrow and usually less than one